SN 10/824,691
Docket No. S-102,389
In Response to Office Action dated September 20, 2005

AMENDMENTS TO THE CLAIMS:

Please amend the claims as shown below. This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

1-5. (cancelled)

6. (currently amended) A process for preparing a bulk, superhard, nanocomposite compact, comprising:

(a) ball milling a mixture of graphite and hexagonal boron nitride to produce a ball-milled ~~, the ball-milled~~ mixture comprising amorphous boron nitride, nanocrystalline boron nitride or mixtures thereof, the ball-milled mixture further comprising amorphous carbon, nanocrystalline graphitic carbon or mixtures thereof;

(b) encapsulating the ball-milled mixture at a pressure in the range of from about 15 GPa to about 25 GPa; and

(c) sintering the encapsulated ball-milled mixture at a temperature of about 1000-2500 K, thereby producing a bulk, superhard nanocomposite compact consisting essentially of nanocrystalline grains of at least one ternary phase of B-C-N surrounded by amorphous diamond-like carbon grain boundaries.

7. (original) The process of claim 6, wherein the ball milled mixture of graphite hexagonal boron nitride consists essentially of about 1-4 parts graphite to about 1 part hexagonal boron nitride.

8. (withdrawn) The process of claim 7, wherein the ball milled mixture of graphite and hexagonal boron nitride consists essentially of about 1 part graphite to about 1 part hexagonal boron nitride.

9. (withdrawn) The process of claim 7, wherein the ball milled mixture of graphite and hexagonal boron nitride consists essentially of about 2 parts graphite to about 1 part hexagonal boron nitride.

10. (original) The process of claim 7, wherein the ball milled mixture of graphite and hexagonal boron nitride consists essentially of 4 parts graphite to about 1 part hexagonal boron nitride.

11. (cancelled)

12. (original) The process of claim 7, wherein the encapsulated ball-milled mixture is sintered at a pressure of about 15-25 GPa and at a temperature of about 2000-2500 K.

13. (original) The process of claim 7, wherein the encapsulated ball-milled mixture is sintered at a pressure of about 16-25 GPa and at a temperature of about 2100-2500 K.

14. (original) The process of claim 7, wherein the encapsulated ball-milled mixture is sintered at a pressure of about 20-25 GPa and at a temperature of about 2000-2500 GPa.

15. (original) The process of claim 7, wherein the encapsulated ball-milled mixture is sintered at a pressure of about 20-25 GPa and at a temperature of about 2100-2400 K.

16. (original) The process of claim 7, wherein the encapsulated ball-milled mixture is sintered at a pressure of about 20 GPa and at a temperature of about 2000-2400 K.

17. (withdrawn) The process of claim 7, wherein the encapsulated ball-milled mixture is sintered at a pressure of about 25 GPa and at a temperature of about 2100-2300 K.

18. (previously presented) The process of claim 6, wherein step (b) comprises encapsulating the ball-milled mixture in capsule comprising platinum, gold, rhenium, or boron nitride.

19. (original) The process of claim 7, wherein said compact has a Vickers hardness of about 41-68 GPa.

20. (original) The process of claim 7, wherein said compact has a Vickers hardness of about 50-68 GPa.

21. (original) The process of claim 7, wherein said compact has a Vickers hardness of about 62-68 GPa.

22. (original) The process of claim 7, wherein said compact has a Vickers hardness of 68 GPa.

23-43. (cancelled)